White-tailed Deer Population Status
2003

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Abstract

The statewide posthunt white-tailed deer population estimate for 2003 was 1,109,000. This was 58% above the statewide goal of 702,300. With a harvest of nearly 193,000 adult bucks and more than 291,000 antlerless deer, the posthunt 2003 population was 22% higher than a year ago. The 2003 posthunt population was more than 20% above goal in 94 deer management units. The statewide 2003 posthunt population was the third highest on record.

Methods

Population estimates for most deer management units in the state were calculated using the Sex-Age-Kill (SAK) formula. This formula combines information on the age composition of the buck harvest with an estimate of the percentage of adult buck mortality that is due to legal hunting (buck recovery rate) to estimate the percentage of the adult buck population that is harvested (buck harvest rate). The size of the prehunt adult buck population in each management unit is estimated by dividing the unit's registered buck harvest by the estimate of the buck harvest rate. The prehunt adult buck population estimate is then expanded to estimate the entire prehunt deer population by 1) multiplying the buck population estimate by the adult sex-ratio to estimate the size of the adult doe population, and 2) multiplying the doe population estimate by the fall fawn:doe ratio to estimate the fall fawn population. The posthunt deer population is estimated by subtracting the total harvest from the prehunt estimate.

Primary inputs to the SAK formula are 1) year- and unit-specific harvests of antlered and antlerless deer, 2) the average percentage of yearlings among harvested bucks, 3) the average percentage of yearlings among harvested does, 4) the buck recovery rate, and 5) fall fawn:doe ratios. The percentage of yearlings among harvested bucks is used as an estimate of the annual mortality rate of adult bucks. Multi-year averages are used for yearling buck and doe percents because annual variation in reproduction or fawn survival can affect annual estimates of the percentage of yearlings, thereby biasing estimates of adult buck mortality. In addition, year- and unit-specific samples of aged deer are often inadequate for reliable estimation of yearling percents.

Average yearling buck and doe percents and buck recovery rates were updated in 2003 for most deer management units in the state. Fawn:doe ratios were updated in the Northern and Central forest regions based on the results of the Summer Deer Observation survey.

The November 2003 firearm season opened on the second latest possible date and rutting activity was past peak. Weather conditions varied considerably throughout the season and state. The season was colder than normal, with strong winds on opening weekend and later in the week. Heavy rain started late on Saturday of the opening weekend and continued through Sunday in much of the state, with snow and sleet in portions of the north. Weather conditions were considered good for hunting during the middle of the season. Corn harvest was near normal. The Deer Committee did not believe it was appropriate to adjust estimates of buck recovery rate because of the weather.

Throughout much of the state hunting pressure appeared to return to near average following reduced activity in 2002 in response to the discovery of chronic wasting disease (CWD) in southwestern Wisconsin. Sales of gun deer licenses were 4% higher than in 2002 but were still 6% lower than in 2001.

Population estimates for units in the CWD management zones were not based on the SAK method because buck harvest rates were likely below average due to public concerns related to hunting in an area potentially affected by CWD, as well as earn-a-buck regulations that required the harvest of an antlerless deer before harvesting an adult buck. Therefore, posthunt 2003 population estimates were based on helicopter quadrat surveys in the Intensive Harvest Zone and fixed-wing transect surveys in units in the Herd Reduction Zone. Deer per mile indices from the fixed-wing transect surveys were converted to estimates of density based on a regression model developed in the Intensive Harvest Zone that related fixed-wing counts to helicopter survey estimates. In addition, accounting population models were developed for nine of the 14 Herd Reduction Zone units where we had a series of previous SAK estimates with which to calibrate the accounting models.

Results

Estimates of size of posthunt deer populations during 2003 were made for 119 deer management units (Table 1). Statewide, the 2003 posthunt population estimate was 1,109,000, which was 58% above goal. The estimated statewide population was 22% higher than in 2002. The statewide 2003 posthunt population was third highest on record. Unit-specific posthunt population densities ranged from 12-73 deer/mi^2 of deer range and averaged 32 deer/mi^2.

In 2003, 2 units had population estimates that were more than 20% below goal. Seven units had populations that were 1-20% below goal. Sixteen units had populations that were between goal and 20% above goal. Population estimates in 29 units were 21-50% above goal and 65 units had populations that are more than 50% above goal. Population estimates declined 20% or more from 2002 in 5 units and increased 20% or more in 62 units.

Deer populations in the Northern Forest, Eastern Farmland, and Western Farmland regions increased substantially during the 1980's (Figure 1). Aggressive harvests during the late 1980's and early 1990's, combined with very poor recruitment in the Northern and Central Forest regions in 1992, reduced populations to near goal in the North and below goal in the Central Forest. Deer populations in all regions grew rapidly following the conservative harvests in 1993 reaching an all time record posthunt population in excess of 1,120,000 in 1995. Liberal harvests in the farmland regions together with over-winter losses associated with the severe winters of 1995-96 and 1996-97 reduced populations from the 1995 peak in all regions. The near-record mild winter of 1997-98 and relatively conservative antlerless harvests in 1998 allowed population growth in all regions. Substantial antlerless harvests across much of the state in 2000, together with the moderately severe winter of 2000-01 in the Northern Forest, set the stage for population declines in all regions in 2001. Moderate population declines apparently continued in the Northern Forest and Western Farmland regions in 2002 but reduced harvests in 2002 lessened population declines in the Eastern and Southern farmland regions. The lower harvests in 2002 led to population increased in all regions in 2003.

The posthunt population in the Northern Forest region increased 13% from 2002 to 2003 and was 33% above goal in 2003. The Central Forest population increased 4% between 2002 and 2003 and was 23% above goal in 2003. The Eastern Farmland population increased 19% and was 73% above goal. Populations in the Western Farmland increased 39% and populations in

the Southern Farmland increased 34%. The Western and Southern Farmland populations were 64% and 113% over goal, respectively.

Some of apparent population increase between 2002 and 2003, especially in the farmland regions, may reflect underestimates of population size in 2002. Hunting pressure in 2002 appeared to have been reduced by the discovery of CWD. In 2002 the Deer Committee decided to lower estimates of buck recovery rates for Northern Forest units to account for apparent reductions in harvest pressure; however, no adjustments were made to population estimates in other regions. As a result, population estimates in other regions may have been conservative.

Table 1. *White-tailed deer population status in Wisconsin deer management units, 2002-2003.*

Region & Unit	Population goal		2002 posthunt population			2003 posthunt population			% change from 2002
	Num.	Den.[a]	Num.	Den.[a]	% over goal	Num.	Den.[a]	% over goal	
Northern Forest									
01	3,220	20	4,100	26	28	6,300	39	94	52
01M	320	10	240	8	-25	830	26	160	246
02	9,198	18	11,700	23	27	16,600	32	81	42
03	6,660	12	11,100	20	66	15,900	29	139	44
04	3,490	10	4,900	14	40	5,800	17	66	18
05	4,520	20	7,700	34	70	7,400	33	65	-3
06	5,232	12	7,800	18	49	11,000	25	111	42
07	2,835	15	2,200	11	-24	2,300	12	-19	6
08	7,400	20	6,200	17	-16	11,000	30	48	77
09	8,760	20	9,300	21	6	14,000	32	60	51
10	8,625	25	8,700	25	1	9,900	29	15	14
11	6,820	20	6,100	18	-10	8,200	24	20	33
12	4,488	17	5,600	21	24	6,600	25	48	19
13	10,725	15	16,500	23	54	16,600	23	55	1
14	4,592	14	6,500	20	41	8,800	27	91	35
17	3,570	15	4,400	18	22	6,100	25	70	39
18	7,360	20	11,300	31	54	11,100	30	50	-3
19	8,060	20	12,000	30	48	11,000	27	37	-8
20	6,804	18	8,700	23	28	9,700	26	43	11
24	5,560	20	5,700	20	2	7,000	25	26	23
25	8,740	20	10,600	24	21	15,900	36	82	51
26	7,820	20	10,000	26	28	7,600	19	-3	-25
28	7,216	11	7,700	12	6	14,700	22	103	91
29A	2,868	12	3,900	16	36	4,700	20	64	20
29B	2,796	12	2,300	10	-17	3,600	16	30	56
30	4,725	15	5,500	17	16	7,400	23	56	34
31	8,280	20	8,900	21	7	8,200	20	-1	-8
32	10,227	21	9,900	20	-3	10,900	22	7	11
34	4,454	17	5,200	20	18	5,300	20	19	1
35	8,180	20	11,000	27	34	9,000	22	10	-18
36	6,850	25	9,300	34	36	7,200	26	5	-23
37	5,875	25	6,800	29	15	6,300	27	8	-6
38	7,760	20	9,500	25	23	10,100	26	30	5
39	8,220	20	7,200	17	-13	6,300	15	-23	-12
40	6,560	20	4,600	14	-31	6,100	19	-7	33
41	4,875	25	5,700	29	18	3,900	20	-20	-32
42	6,540	20	8,200	25	26	8,200	25	26	0
43	6,120	15	7,600	19	24	8,200	20	34	8
44	7,922	17	7,700	16	-3	8,300	18	4	8
45	11,860	20	9,500	16	-20	10,300	17	-13	8
49A	5,875	25	5,500	23	-6	4,800	21	-18	-12
49B	4,550	25	5,300	29	17	3,400	19	-25	-35
50	6,680	20	7,400	22	10	7,800	23	17	6
52	6,080	20	8,300	27	37	6,400	21	5	-24
78	440	20	800	35	75	700	31	53	-12
Regional total	279,752		329,100		18	371,400		33	13

Table 1. *Cont.*

Region & Unit	Population goal		2002 posthunt population			2003 posthunt population			% change from 2002
	Num.	Den.	Num.	Den.	% over goal	Num.	Den.	% over goal	
Central Forest									
53	11,525	25	11,600	25	1	15,000	32	30	29
54A	12,100	25	15,100	31	24	15,900	33	32	6
55	15,775	25	18,900	30	20	18,000	29	14	-5
56	10,050	30	12,800	38	28	12,000	36	20	-6
58	12,650	25	15,100	30	19	15,400	30	22	2
Regional total	62,100		73,500		18	76,300		23	4
Eastern Farmland									
27	4,960	20	5,000	20	0	9,300	38	88	87
33	5,520	20	5,800	21	5	7,800	28	42	35
46	8,025	25	10,500	33	31	10,700	33	33	2
47	6,725	25	8,900	33	33	9,900	37	47	10
51A	5,500	25	8,700	39	57	9,200	42	67	6
51B	9,725	25	12,100	31	24	16,200	42	67	35
57	3,212	22	4,100	28	27	5,300	36	66	31
57A	5,950	25	7,100	30	20	6,900	29	16	-3
57B	6,300	25	7,000	28	11	9,100	36	44	30
57C	7,980	30	6,800	25	-15	11,000	41	38	63
62A	10,050	25	12,200	30	21	18,000	45	79	48
62B	9,075	25	20,100	55	122	20,300	56	123	1
63A	8,475	25	16,500	49	95	19,000	56	124	15
63B	6,300	25	10,300	41	63	12,400	49	97	21
64	4,860	20	9,000	37	85	8,300	34	71	-8
64M	810	10	2,900	36	260	3,300	41	310	14
65A	5,160	30	6,100	36	19	6,200	36	21	2
65B	10,410	30	13,200	38	26	15,600	45	50	18
66	4,300	25	10,100	59	135	10,700	62	148	6
80A	2,280	15	4,000	26	73	5,000	33	118	25
80B	3,880	20	8,000	41	105	9,400	49	143	19
81	270	15	760	42	181	1,000	54	263	29
Regional total	129,767		189,200		46	224,600		73	19
Western Farmland									
15	10,350	25	9,900	24	-5	13,200	32	27	33
16	8,375	25	7,600	23	-9	9,800	29	18	30
21	5,625	25	5,500	24	-2	7,300	32	29	32
22	6,980	20	6,700	19	-5	10,700	31	54	61
22A	7,060	20	7,500	21	6	10,600	30	51	42
23	8,060	20	10,400	26	29	13,100	33	63	27
59A	10,400	20	10,600	20	2	14,500	28	39	37
59B	10,305	15	11,800	17	15	17,400	25	69	47
59C	15,650	25	19,200	31	23	23,900	38	53	24
59D	7,680	20	11,000	29	43	15,500	40	102	41
59M	440	10	800	19	90	800	18	75	-8

Table 1. *Cont.*

Region & Unit	Population goal		2002 posthunt population			2003 posthunt population			% change from 2002
	Num.	Den.	Num.	Den.	% over goal	Num.	Den.	% over goal	
Western Farmland continued									
60A	3,400	20	3,000	18	-11	3,700	22	8	21
60B	1,660	20	1,700	21	5	2,800	33	66	58
60M	800	10	1,600	20	97	1,900	23	131	17
61	14,370	15	23,200	24	61	36,700	38	156	58
Regional total	111,155		130,500		17	181,900		64	39
Southern Farmland									
54B	4,650	25	5,100	27	10	6,200	33	34	22
54BCWD	2,090	10	4,800	24	137	4,800	23	130	-3
54C	2,375	25	3,000	32	27	4,100	44	74	37
67A	10,620	30	16,900	48	59	23,600	67	122	40
67B	5,640	30	10,900	58	94	13,800	73	144	26
68A	3,900	30	7,200	56	86	8,500	66	119	18
68B	5,490	30	4,800	26	-12	7,000	38	27	44
69	9,775	25	8,900	23	-9	11,500	29	17	28
70CWD[b]	2,070	10	7,400	30	204	9,500	46	359	51
70ACWD[c]	2,190	10	8,200	38	276				
IHZ-CWD[d]	<3,605	<5				25,200	35	599	
70BCWD[b]	1,940	10	5,300	25	152	6,800	35	251	39
70ECWD	690	10	2,700	39	287	3,200	46	364	20
70G	2,070	30	3,500	51	71	3,600	52	73	1
70GCWD	530	10	1,500	27	174	1,800	34	240	24
71[e]			7,200	25	-2				
71CWD[b]	5,620	10	9,500	28	184	13,500	24	140	
72	10,080	20	13,700	27	35	20,600	41	104	51
73B	3,700	20	4,900	27	33	5,200	28	40	6
73BCWD	540	10	1,000	19	91	1,200	22	122	16
73D	3,160	20	2,800	17	-13	4,200	27	34	53
73ECWD[b]	1,530	10	6,800	24	145	3,100	20	103	-17
74A	3,000	15	3,800	19	26	5,400	27	81	44
74B	8,640	20	7,500	17	-13	10,900	25	26	45
75ACWD[b]	2,050	10	5,800	26	160	7,000	34	241	31
75CCWD[b]	560	10	1,200	23	133	2,500	45	346	92
75DCWD	1,120	10	3,100	27	174	5,400	48	382	76
76CWD[b]	1,340	10	2,600	16	62	5,400	40	303	148
76A	7,625	25	8,500	28	12	12,900	42	70	51
76MCWD[b]	530	10	1,300	24	144	2,300	43	334	78
77A[e]			3,000	30	50				
77ACWD	1,230	10	500	21	109	5,300	43	331	
77B	3,240	15	3,700	17	13	4,300	20	32	17
77C	4,830	15	8,300	26	72	8,900	28	84	7
77M	3,120	10	4,600	15	46	7,200	23	130	57
Regional total	119,550		190,000		59	254,900		113	34
Total	**702,324**		**912,300**		**30**	**1,109,100**		**58**	**22**

[a] Deer/mi^2 of deer range.
[b] Population goal and 2003 estimate applies to that portion of unit in the 2003 CWD Herd Reduction Zone. Population estimate in 2002 may apply to a different area due to changes in Herd Reduction Zone boundary.
[c] DMU 70A is entirely contained within the CWD Intensive Harvest Zone.
[d] CWD Intensive Harvest Zone includes all of 70A and parts of 8 surrounding deer management units.
[e] Combined in 2003 with the portion of the unit in the CWD Herd Reduction Zone.

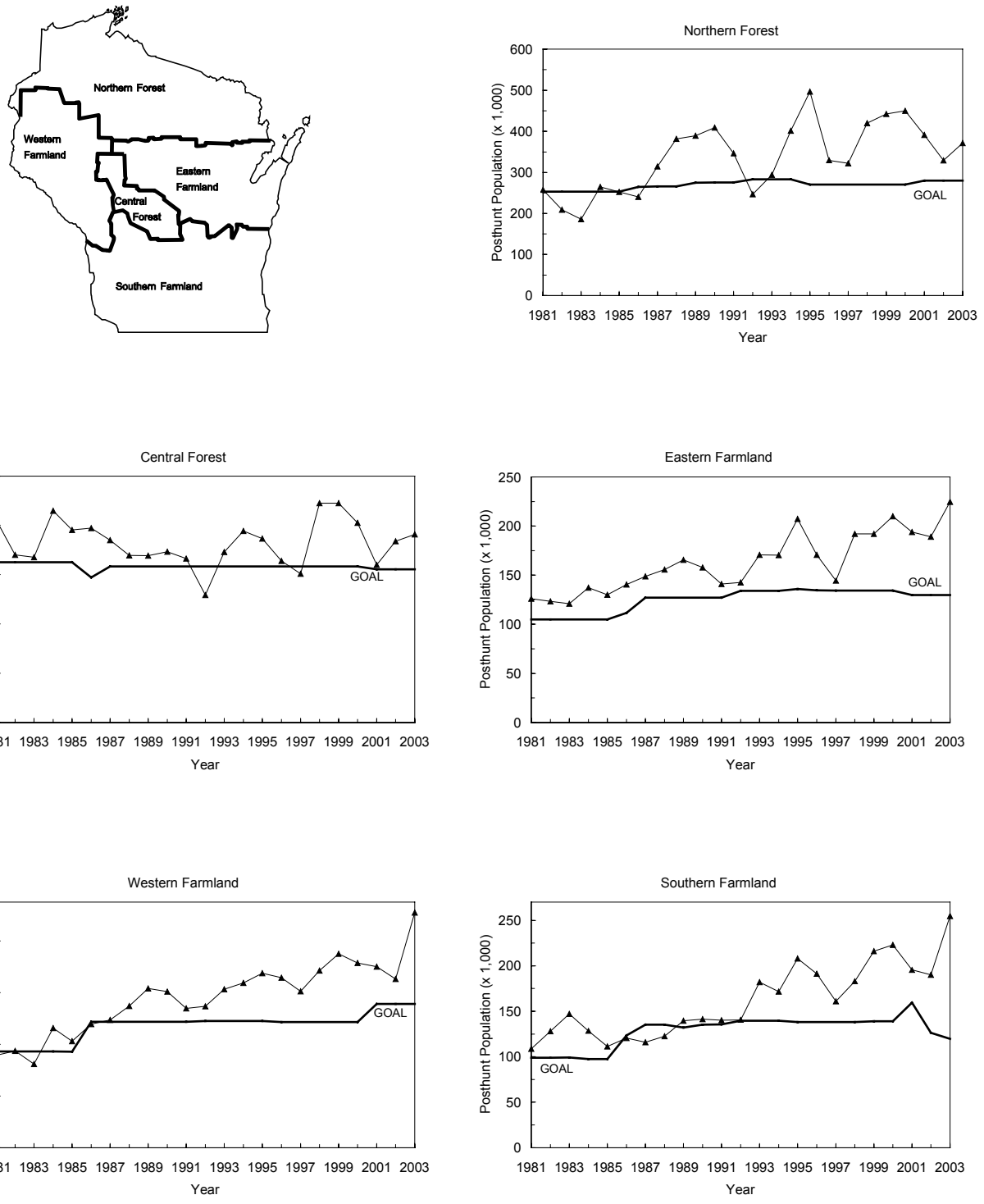

Figure 1. *Regional white-tailed deer population trends in Wisconsin, 1981-2003.*